

Appln. No.: 10/076,448

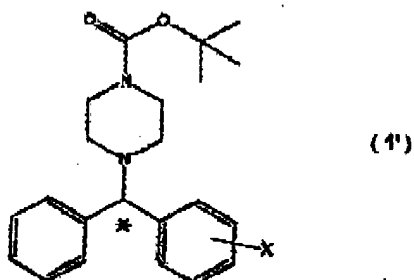
Supplemental Amendment under 37 C.F.R. § 1.111

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions and listings of claims in the application:

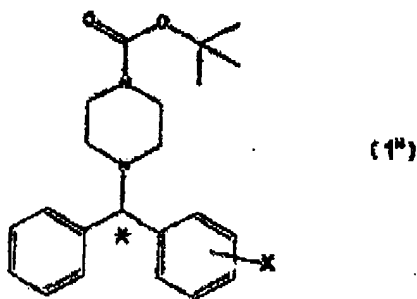
**LISTING OF CLAIMS:**

1. (previously presented): An optically active 4-(tert-butoxycarbonyl)piperazine compound of formula (1'):



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designates an asymmetric carbon atom.

2. (previously presented): A composition comprising an optical isomer of formula (1''):

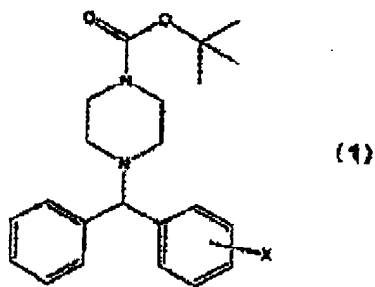


Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

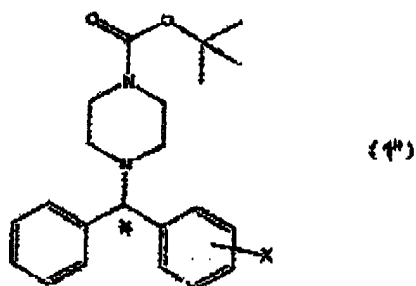
wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designates an asymmetric carbon atom, and an enantiomer thereof, wherein one optical isomer is present in excess to the enantiomer thereof.

3. (original): A 4-(tert-butoxycarbonyl)piperazine compound of formula (1):



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group.

4. (previously presented): An optical isomer of formula (1''):

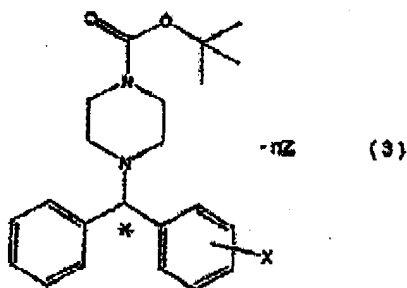


wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designates an asymmetric carbon atom, or salts thereof.

5. (currently amended): An adduct salt of formula (3):

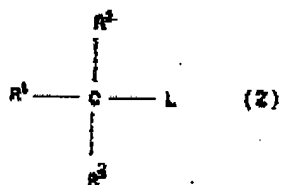
Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111



wherein X denotes a chlorine atom, a C1- C3 alkyl group or a C1-C3 alkoxy group and \* designates an asymmetric carbon atom, n represents an integer of 1 or 2, and

Z represents an optically active acid of formula (2):



wherein L represents -COOH or -SO<sub>3</sub>H,

R<sup>2</sup> represents a hydrogen atom or a hydroxyl group,

R<sup>1</sup> and R<sup>3</sup> are the same or different and each independently represent

a hydrogen atom, a halogen atom, an arylcarbonyloxy group,

a linear or branched alkyl group which may be substituted with at least one group

selected from the group consisting of a hydroxyl group, a halogen atom, an arylcarbonyloxy group, a carboxy group and an arylaminocarbonyl group;

an aryl group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group and an alkoxy group;

Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

an aralkyl group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

an aryloxy group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

a cyclic alkyloxy group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

or

a cyclic alkyl group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, a hydroxyl group and a phenylcarbonylamino group; or

$R^1$  and  $R^3$  may be bonded together to form

an alkylene group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, a carboxyl group, an oxo group, a hydroxyl group, and a phenylcarbonylamino group, or

a heterocycle which may be substituted with at least one group selected from the group consisting of an alkyl group, alkoxy or a halogen atom.

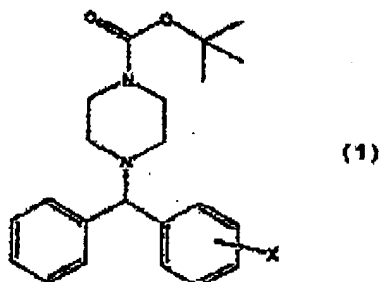
6. (original): An adduct salt according to claim 5, wherein the acid of formula (2) is optically active O,O'-dibenzoyltartaric acid.

7. (currently amended): An adduct salt according to any one of claims ~~1, 2, 3, 4, 5,~~ or 5 or 6, wherein X represents a chlorine atom at 4-position of the phenyl group.

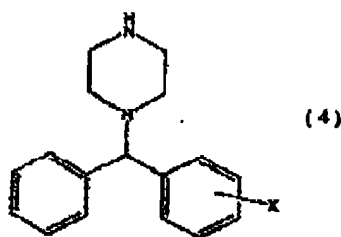
Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

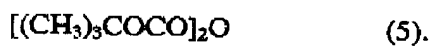
8. (previously presented): A process for producing a 4-(tert-butoxycarbonyl)piperazine compound of formula (1):



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, which comprises reacting 1-[(substituted phenyl) phenylmethyl]piperazine of formula (4):



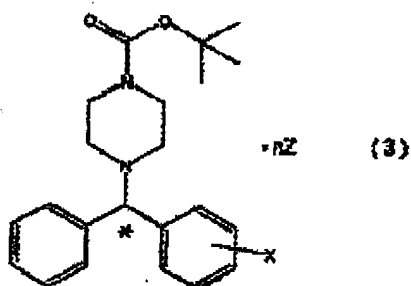
wherein X has the same meaning as defined above, with di-tert-butyl dicarbonate of formula (5):



9. (currently amended): A process for producing an optically active adduct salt of formula (3):

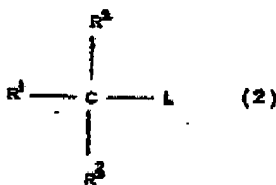
Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, \* represents an asymmetric carbon atom, and n represents an integer of 1 or 2, and

Z represents an optically active acid of formula (2):



wherein L represents  $-\text{COOH}$  or  $-\text{SO}_3\text{H}$ ,

$\text{R}^2$  represents a hydrogen atom or a hydroxyl group;

$\text{R}^1$  and  $\text{R}^3$  are the same or different and independently represent

a hydrogen atom, a halogen atom, or an arylcarbonyloxy group;

a linear or branched alkyl group which may be substituted with at least one group selected from the group consisting of a hydroxyl group, a halogen atom, an arylcarbonyloxy group, a carboxy group and an arylaminocarbonyl group;

an aryl group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group and an alkoxy group;

Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

an aralkyl group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

an aryloxy group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

a cyclic alkyloxy group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a hydroxyl group;

or

a cyclic alkyl group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group a hydroxyl group and a phenylcarbonylamino group; or

$R^1$  and  $R^3$  may be bonded together to form

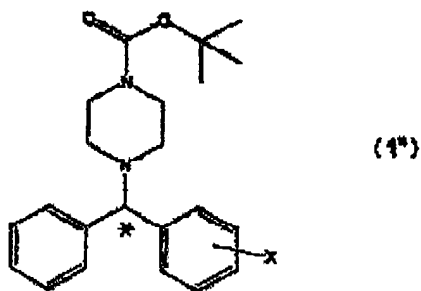
an alkylene group which may be substituted with at least one group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, a carboxyl group, an oxo group, a hydroxyl group, and a phenylcarbonylamino group, or

a heterocycle which may be substituted with at least one group selected from the group consisting of an alkyl group, an alkoxy group and a halogen atom,

which comprises reacting a composition comprising an optical isomer of 4-(tert-butoxycarbonyl)piperazine compound of formula (1''):

Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

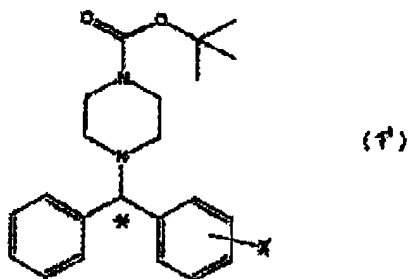


wherein X and \* are as defined above, and an enantiomer thereof,

with an optically active acid of formula (2) as defined above and isolating the resulting adduct salt.

10. (original): A process according to claim 9, which further comprises recrystallizing the acid adduct salt of the optically active 4-(tert-butoxycarbonyl)piperazine of formula (3).

11. (previously presented): A process according to claim 9 or 10, which further comprises reacting an adduct salt of formula (3), with a base to produce an optically active 4-(tert-butoxycarbonyl)piperazine of formula (1'):

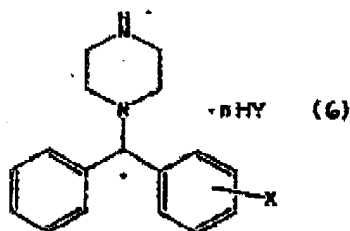


Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

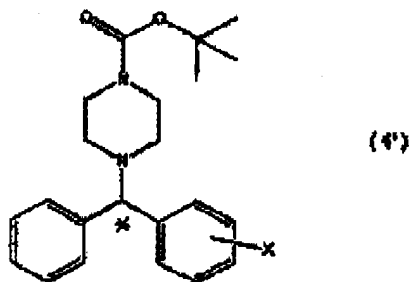
wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group and \* designates an asymmetric carbon atom.

12. (previously presented): A process for producing an optically active adduct salt of formula (6):



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, \* represents an asymmetric carbon atom, and n represents an integer of 1 or 2,

Y represents a halogen atom,  $-\text{OSO}_3\text{H}$ ,  $-\text{OSO}_2\text{CH}_3$ ,  $-\text{OCOCF}_3$ ,  $-\text{OCOCH}_3$  and  $-\text{OCOH}$ , which comprises reacting an optically active 4-(tert-butoxycarbonyl)piperazine of formula (1'):

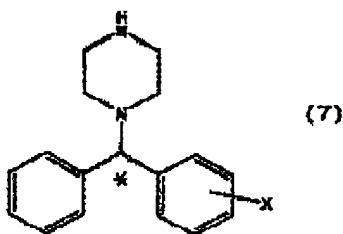


wherein X and \* are as defined above with an acid of formula: HY, wherein Y represents the same as defined above.

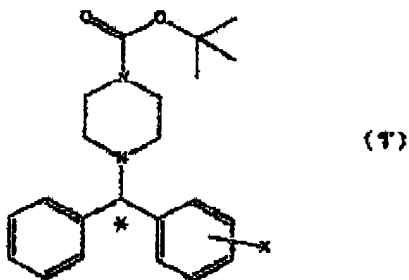
13. (previously presented): A process for producing an optically active 1-[(substituted phenyl)phenylmethyl]piperazine of formula (7):

Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, and \* represents an asymmetric carbon atom, which process comprises reacting an optically active 4-(tert-butoxycarbonyl)piperazine compound of formula (1'):



wherein X denotes a chlorine atom, a C1-C3 alkyl group or a C1-C3 alkoxy group, and \* represents an asymmetric carbon atom, with an acid and subsequently with a base.

14 (new): A compound as in claim 1, wherein X represents a chlorine atom at 4-position of the phenyl group.

15 (new): A compound as in claim 2, wherein X represents a chlorine atom at 4-position of the phenyl group.

16 (new): A compound as in claim 3, wherein X represents a chlorine atom at 4-position of the phenyl group.

FROM SUGHRUE MION PLLC DC

(MON) 5. 24' 04 14:19/ST. 14:16/NO. 4260759494 P 13

Appln. No.: 10/076,448

Supplemental Amendment under 37 C.F.R. § 1.111

17 (new): An optical isomer as in claim 4, wherein X represents a chlorine atoms at 4-position of the phenyl group.